



*C. J. C.*

PATENT  
42140/RJP/B600

**IN THE UNITED STATES PATENT AND TRADEMARK OFFICE**

U.S. Patent No. : 6,891,881 Confirmation No. 3985  
Issued : May 10, 2005  
Inventor(s) : Jason Alexander Trachewsky, et al.  
Application No. : 09/825,775  
Filed : April 4, 2001  
Title : METHOD OF DETERMINING AN END OF A TRANSMITTED  
FRAME IN A FRAME-BASED COMMUNICATIONS NETWORK

**REQUEST FOR CERTIFICATE OF CORRECTION**

Office of Certificates of Correction  
Commissioner for Patents  
P.O. Box 1450  
Alexandria, VA 22313-1450

P. O. Box 7068  
Pasadena, CA 91109-7068  
October 17, 2005

Commissioner:

Submitted herewith are two copies of a proposed Certificate of Correction for the above-referenced patent. The errors are identified in detail in the proposed certificate, and the corresponding text in the application is located as follows:

Location in Patent

Location in Application

**Certificate**

PTO errors:

**OCT 24 2005**

**of Correction**

In the Claims

Column 114, line 13, Claim 1

Amendment dated Aug. 13, 2004, pg. 3, Claim 1, line 9

Column 114, line 52, Claim 8

Amendment dated Aug. 13, 2004, pg. 5, Claim 8, line 5

Applicant errors:

FIG. 2, Sheet 5 of 101

Informal Drawings as submitted Apr. 4, 2001, FIG. 2

FIG. 12g, Sheet 18 of 101, 2nd Row,  
Column 16

Informal Drawings as submitted Apr. 4, 2001, FIG. 12g

FIG. 12g, Sheet 18 of 101, 7th Row,  
Column 6

Informal Drawings as submitted Apr. 4, 2001, FIG. 12g

FIG. 12g, Sheet 18 of 101, 8th Row,  
Column 3

Informal Drawings as submitted Apr. 4, 2001, FIG. 12g

**OCT 25 2005**

I hereby certify that this correspondence is being deposited with the  
U.S. Postal Service as first class mail in an envelope addressed to:  
Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-  
1450 on  
Oct 17, 2005 *[Signature]*  
(Date of Deposit)

**U.S. Patent No. 6,891,881**

FIG. 12g, Sheet 18 of 101, 8th Row, Column 15	Informal Drawings as submitted Apr. 4, 2001, FIG. 12g
FIG. 12g, Sheet 18 of 101, 9th Row, Column 15	Informal Drawings as submitted Apr. 4, 2001, FIG. 12g
FIG. 15, Sheet 20 of 101	Informal Drawings as submitted Apr. 4, 2001, FIG. 15
FIG. 25, Sheet 28 of 101, 1st Row, Column 1	Informal Drawings as submitted Apr. 4, 2001, FIG. 25
FIG. 26, Sheet 28 of 101, 1st Row, Column 1	Informal Drawings as submitted Apr. 4, 2001, FIG. 26
FIG. 30, Sheet 32 of 101	Informal Drawings as submitted Apr. 4, 2001, FIG. 30
FIG. 37, Sheet 37 of 101, 6th Row, Column 3	Informal Drawings as submitted Apr. 4, 2001, FIG. 37
FIG. 42, Sheet 41 of 101, 1st Row, Column 2	Informal Drawings as submitted Apr. 4, 2001, FIG. 42
FIG. 45, Sheet 45 of 101, 17th Row, Column 3	Informal Drawings as submitted Apr. 4, 2001, FIG. 45
FIG. 52b, Sheet 51 of 101, 8th Row, Column 1	Informal Drawings as submitted Apr. 4, 2001, FIG. 52b
FIG. 52d, Sheet 52 of 101, 2nd Row, Column 4, 5th line	Informal Drawings as submitted Apr. 4, 2001, FIG. 52d
FIG. 52d, Sheet 52 of 101, 4th Row, Column 4, 3rd line	Informal Drawings as submitted Apr. 4, 2001, FIG. 52d
FIG. 52f.1, Sheet 54 of 101, 7th Row, Column 1	Informal Drawings as submitted Apr. 4, 2001, FIG. 52f.1
FIG. 53, Sheet 56 of 101, 4th Row, Column 2, line 2	Informal Drawings as submitted Apr. 4, 2001, FIG. 53
FIG. 58, Sheet 59 of 101, Ref No. 3058	Informal Drawings as submitted Apr. 4, 2001, FIG. 58
FIG. 58, Sheet 59 of 101, Ref. No. 3048	Informal Drawings as submitted Apr. 4, 2001, FIG. 58
FIG. 73, Sheet 73 of 101, Ref. No. 2044	Informal Drawings as submitted Apr. 4, 2001, FIG. 73
FIG. 74, Sheet 74 of 101	Informal Drawings as submitted Apr. 4, 2001, FIG. 74

**U.S. Patent No. 6,891,881**

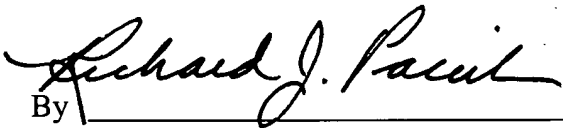
FIG. 75, Sheet 75 of 101	Informal Drawings as submitted Apr. 4, 2001, FIG. 75
FIG. 77(1), Sheet 77 of 101, 10th Row, Column 3, line 6	Informal Drawings submitted Apr. 4, 2001, FIG. 77(1)
FIG. 81, Sheet 82 of 101	Informal Drawings submitted Apr. 4, 2001, FIG. 81
FIG. 89a, Sheet 93 of 101, 1st Row, Column 3	Informal Drawings submitted Apr. 4, 2001, FIG. 89a

Applicant(s) errors were unintentional and inadvertent, and were made in good faith through oversight. Correction is accordingly requested under 35 U.S.C. § 255, and our check for the \$100 statutory fee is enclosed. Any deficiency or overpayment should be charged or credited to Deposit Account No. 03-1728. Please show our docket number with any credit or charge to our Deposit Account.

Correction of applicant(s) errors does not constitute new matter or require reexamination. Approval of this certificate is respectfully requested

Respectfully submitted,

**CHRISTIE, PARKER & HALE, LLP**

By   
Richard J. Paciulan  
Reg. No. 28,248  
626/795-9900

RJP/clv

Enclosures: Certificate of Correction (2)  
Check \$100

CLV PAS641284.1-\* -09/2/05 10:48 AM

## UNITED STATES PATENT AND TRADEMARK OFFICE CERTIFICATE OF CORRECTION

PATENT NO. : 6,891,881  
DATED : May 10, 2005  
INVENTOR(S) : Trachewsky et al.

Page 1 of 4

It is certified that error appears in the above-identified patent and that said Letters Patent is hereby corrected as shown below:

### In the Claims

Column 114, line 13, Claim 1	Delete "aagnitude", Insert --magnitude--
Column 114, line 52, Claim 8	Delete "and", Insert --end--

### In the Drawings

FIG. 2, Sheet 5 of 101	Delete Drawing Sheet 5 and substitute therefore the Drawing Sheet, consisting of Fig. 2, as shown on the attached page
FIG. 12g, Sheet 18 of 101, 2nd Row, Column 16 7th Row, Column 6 8th Row, Column 3 8th Row, Column 15 9th Row, Column 15	Delete Drawing Sheet 18 and substitute therefore the Drawing Sheet, consisting of Fig. 12g, as shown on the attached page
FIG. 15, Sheet 20 of 101	Delete Drawing Sheet 20 and substitute therefore the Drawing Sheet, consisting of Fig. 15, as shown on the attached page

MAILING ADDRESS OF SENDER:

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PATENT NO. 6,891,881

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This collection of information is required by 37 CFR 1.322, 1.323, and 1.324. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 1.0 hour to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Attention Certificate of Corrections Branch, Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.

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OCT 25 2005

## UNITED STATES PATENT AND TRADEMARK OFFICE CERTIFICATE OF CORRECTION

PATENT NO. : 6,891,881  
DATED : May 10, 2005  
INVENTOR(S) : Trachewsky et al.

Page 2 of 4

It is certified that error appears in the above-identified patent and that said Letters Patent is hereby corrected as shown below:

FIG. 25, Sheet 28 of 101, 1st Row, Column 1	Delete Drawing Sheet 28 and substitute therefore the Drawing Sheet, consisting of Figs. 25 & 26, as shown on the attached page
FIG. 26, Sheet 28 of 101, 1st Row, Column 1	
FIG. 30, Sheet 32 of 101	Delete Drawing Sheet 32 and substitute therefore the Drawing Sheet, consisting of Fig. 30, as shown on the attached page
FIG. 37, Sheet 37 of 101, 6th Row, Column 3	Delete Drawing Sheet 37 and substitute therefore the Drawing Sheet, consisting of Fig. 37, as shown on the attached page
FIG. 42, Sheet 41 of 101, 1st Row, Column 2	Delete Drawing Sheet 41 and substitute therefore the Drawing Sheet, consisting of Fig. 42, as shown on the attached page
FIG. 45, Sheet 45 of 101, 17th Row, Column 3	Delete Drawing Sheet 45 and substitute therefore the Drawing Sheet, consisting of Fig. 45, as shown on the attached page
FIG. 52b, Sheet 51 of 101, 8th Row, Column 1	Delete Drawing Sheet 51 and substitute therefore the Drawing Sheet, consisting of Figs. 52a & 52b, as shown on the attached page

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Page 3 of 4

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FIG. 52d, Sheet 52 of 101,  
2nd Row, Column 4, 5th line  
4th Row, Column 4, 3rd line

Delete Drawing Sheet 52 and substitute therefore the  
Drawing Sheet, consisting of Figs. 52c & 52d, as  
shown on the attached page

FIG. 52f.1, Sheet 54 of 101. 7th Row,  
Column 1

Delete Drawing Sheet 54 and substitute therefore the  
Drawing Sheet, consisting of Fig. 52f.1, as shown on  
the attached page

FIG. 53, Sheet 56 of 101, 4th Row,  
Column 2, line 2

Delete Drawing Sheet 56 and substitute therefore the  
Drawing Sheet, consisting of Fig. 53, as shown on the  
attached page

FIG. 58, Sheet 59 of 101, Ref No. 3058 &  
Ref. No. 3048

Delete Drawing Sheet 59 and substitute therefore the  
Drawing Sheet, consisting of Fig. 58, as shown on the  
attached page

FIG. 73, Sheet 73 of 101, Ref. No. 2044

Delete Drawing Sheet 73 and substitute therefore the  
Drawing Sheet, consisting of Fig. 73, as shown on the  
attached page

FIG. 74, Sheet 74 of 101

Delete Drawing Sheet 74 and substitute therefore the  
Drawing Sheet, consisting of Fig. 74, as shown on the  
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Page 4 of 4

It is certified that error appears in the above-identified patent and that said Letters Patent is hereby corrected as shown below:

FIG. 75, Sheet 75 of 101

Delete Drawing Sheet 75 and substitute therefore the Drawing Sheet, consisting of Fig. 75, as shown on the attached page

FIG. 77(1), Sheet 77 of 101, 10th Row,  
Column 3, line 6

Delete Drawing Sheet 77(1) and substitute therefore the Drawing Sheet, consisting of Fig. 77, as shown on the attached page

FIG. 81, Sheet 82 of 101

Delete Drawing Sheet 82 and substitute therefore the Drawing Sheet, consisting of Fig. 81, as shown on the attached page

FIG. 89a, Sheet 93 of 101, 1st Row,  
Column 3

Delete Drawing Sheet 93 and substitute therefore the Drawing Sheet, consisting of Figs. 88, 89a, 89b, and 89c, as shown on the attached page

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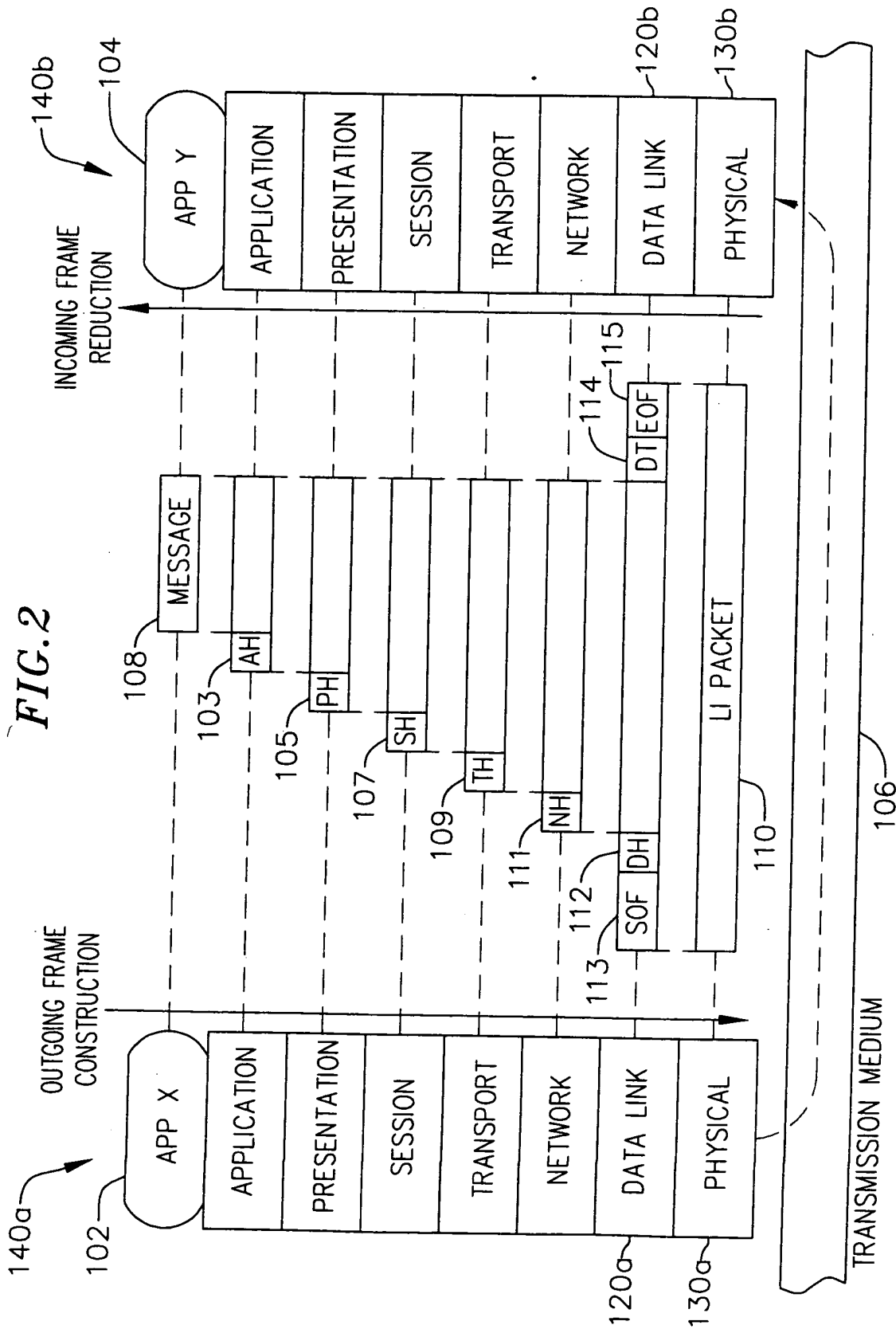
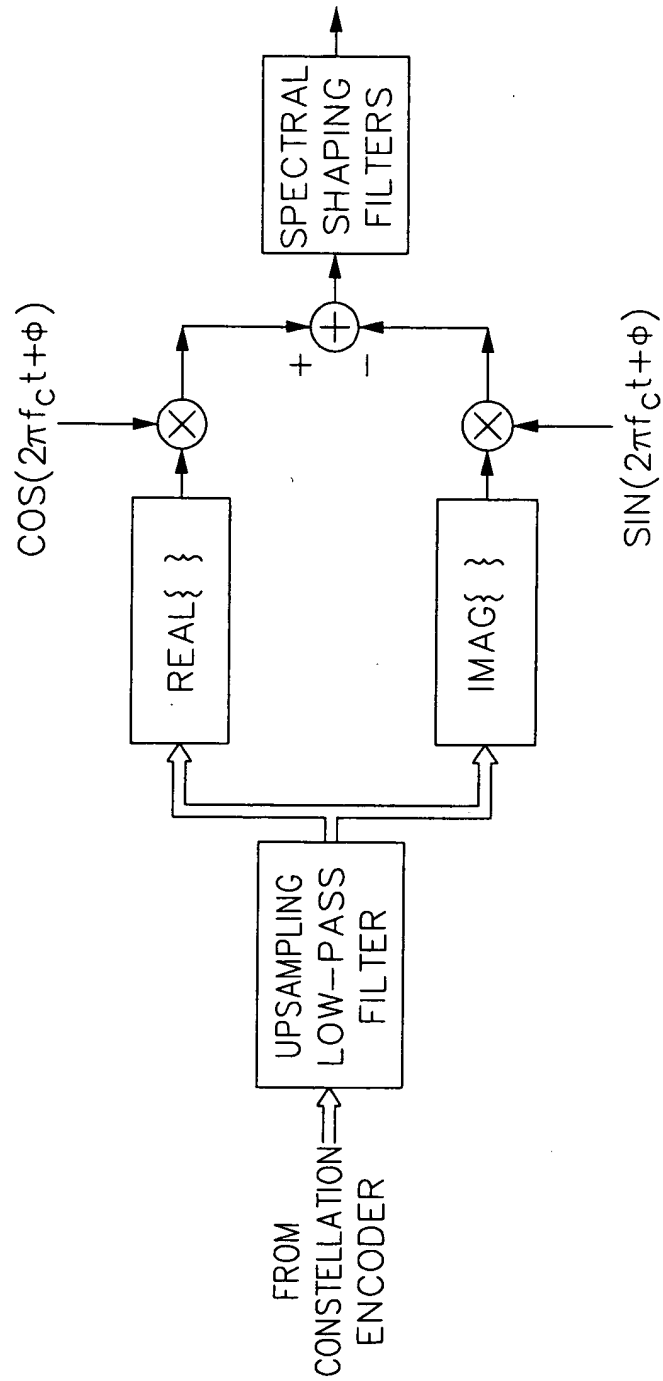




FIG. 12g  
8 BITS PER BAUD

01100100	01100101	01100111	01100110	01100010	01100011	00100001	00100000	00100010	00100110	00100111	00100101	00100100
01101100	01101101	01101111	01101110	01101010	01101011	00101001	00101000	00101010	00101110	00101111	00101101	00101100
01111100	01111101	01111111	01111110	01111010	01111011	00111001	00111000	00111010	00111110	00111111	00111101	00111100
01110100	01110101	01110111	01110110	01110010	01110011	00110001	00110000	00110010	00110110	00110111	00110101	00110100
01010100	01010101	01010111	01010110	01010010	01010011	00010001	00010000	00010010	00010110	00010111	00010101	00010100
01011100	01011101	01011111	01011110	01011010	01011011	00011001	00011000	00011010	00011110	00011111	00011101	00011100
01001100	01001101	01001111	01001110	01001010	01001011	00001001	00001000	00001010	00001110	00001111	00001101	00001100
01000100	01000101	01000111	01000110	01000010	01000011	00000001	00000000	00000010	00000110	00000111	00000101	00000100
11000100	11000101	11000111	11000110	11000010	11000011	10000001	10000000	10000010	10000110	10000111	10000101	10000100
11001100	11001101	11001111	11001110	11001010	11001011	10001001	10001000	10001010	10001110	10001111	10001101	10001100
11011100	11011101	11011111	11011110	11011010	11011011	10011001	10011000	10011010	10011110	10011111	10011101	10011100
11010100	11010101	11010111	11010110	11010010	11010011	10010001	10010000	10010010	10010110	10010111	10010101	10010100
11110100	11110101	11110111	11110110	11110010	11110011	10010001	10010000	10010010	10010110	10010111	10010101	10010100
11111100	11111101	11111111	11111110	11111010	11111011	10011001	10011000	10011010	10011110	10011111	10011101	10011100
11101100	11101101	11101111	11101110	11101010	11101011	10010001	10010000	10010010	10010110	10010111	10010101	10010100
11100100	11100101	11100111	11100110	11100010	11100011	10000001	10000000	10000010	10000110	10000111	10000101	10000100

FIG. 15



**FIG.25**

FREQUENCY RANGE(MHz)	MAXIMUM PEAK-TO-PEAK INTERFERER LEVEL(VOLTS)
0.01-0.1	6.0
0.1-0.6	3.3
0.6-1.7	1.0
1.7-4.0	0.1
7.0-7.3	0.1
10.0-10.15	0.1
14.0-14.35	0.28
18.068-18.168	0.5
21.0-21.45	0.5
24.89-24.99	0.5
28.0-29.7	0.5

**FIG.26**

FREQUENCY RANGE(MHz)	MAXIMUM PEAK-TO-PEAK INTERFERER LEVEL(VOLTS)
0.01-0.1	20.0
0.1-0.6	20.0
0.6-1.7	10.0
1.7-4.0	2.5
7.0-7.3	2.5
10.0-10.15	2.5
14.0-14.35	5.0
18.068-18.168	5.0
21.0-21.45	5.0
24.89-24.99	5.0
28.0-29.7	5.0

FIG. 30

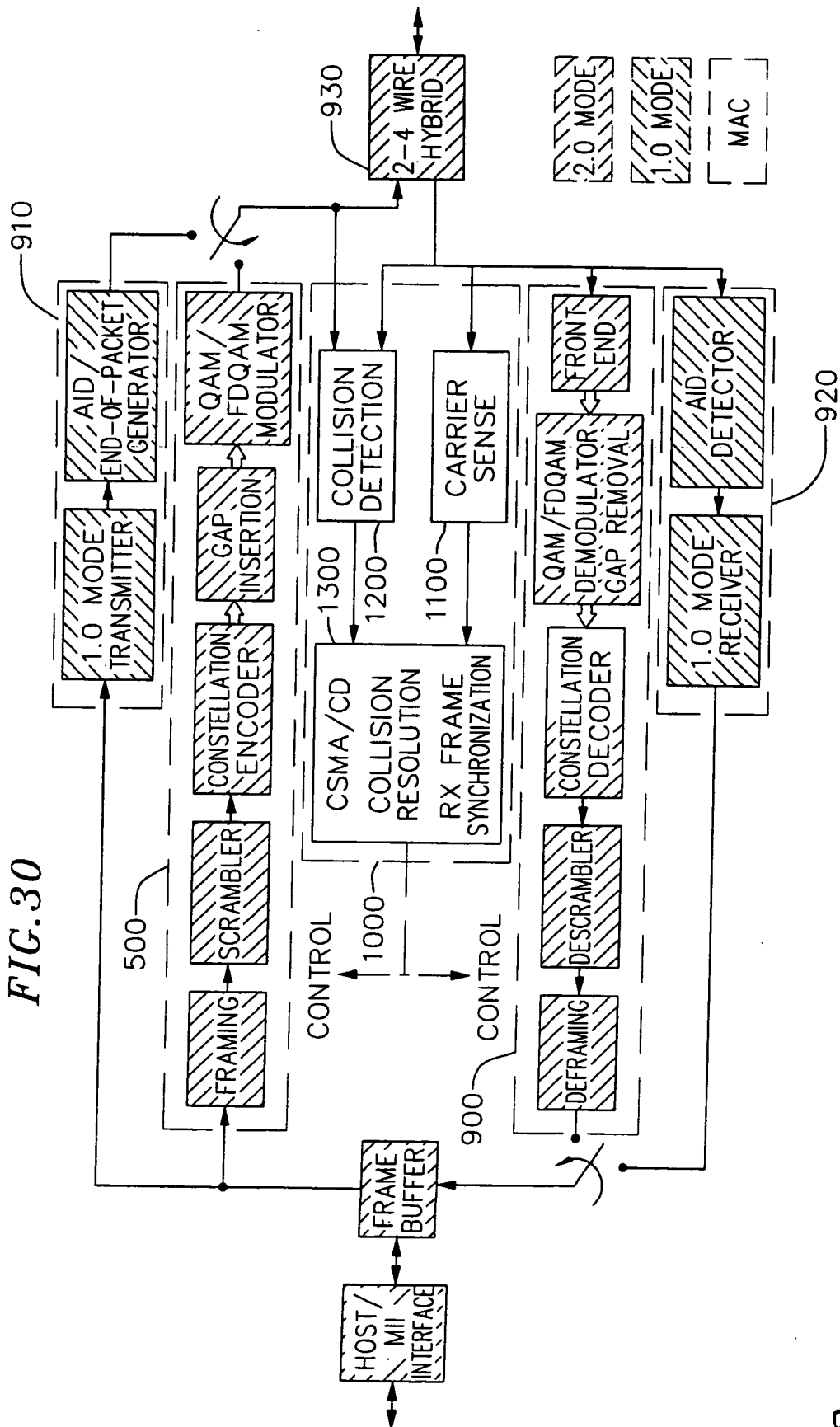


FIG.37

FIELD	LENGTH	EXPLANATION
DA	6 OCTETS	DESTINATION ADDRESS
SA	6 OCTETS	SOURCE ADDRESS
ETHERTYPE	2 OCTETS	0x886c (LINK PROTOCOL FRAME. ASSIGNED TO ASSIGNEE BY IEEE)
SSTYPE	1 OCTET	0—RESERVED 1—RATE REQUEST CONTROL FRAME 2—LINK INTEGRITY SHORT FRAME 3—CAPABILITIES ANNOUNCEMENT 4—LARQ 5—VENDOR—SPECIFIC SHORT FORMAT TYPE 6—126 RESERVED 127 RESERVED VALUES 128–255 CORRESPOND TO THE LONG SUBTYPE
SLENGTH	1 OCTET	NUMBER OF ADDITIONAL OCTETS IN THE CONTROL HEADER, STARTING WITH THE SSVERSION FIELD (OR THE FIRST OCTET FOLLOWING SLENGTH IF IT IS NOT DEFINED AS SSVERSION) AND ENDING WITH THE SECOND (LAST) OCTET OF THE NEXT ETHERTYPE FIELD. MIN IS 2 AND MAX IS 255
SSVERSION	1 OCTET	VERSION NUMBER OF THE CONTROL INFORMATION
DATA	0–252 OCTETS	CONTROL INFORMATION
NEXT ETHERTYPE	2 OCTETS	ETHERTYPE/LENGTH OF NEXT LAYER PROTOCOL, 0 IF NONE.
PAD	41–0 OCTETS	PADDING REQUIRED TO MEET MINIMUM IF DATA<41 OCTETS
FCS	4 OCTETS	FRAME CHECK SEQUENCE

**FIG.42**

BAND SPECIFICATION	A PAYLOAD ENCODING (PE) AND RANK ASSOCIATED WITH A GIVEN BAND. A BAND IS A SINGLE COMBINATION OF BAUD RATE, MODULATION TYPE (E.G. QAM OR FDQAM) AND CARRIER FREQUENCY. TWO BANDS ARE DEFINED IN HPNAV2
LOGICAL CHANNEL, CHANNEL	A FLOW OF FRAMES FROM A SENDER TO ONE OR MORE RECEIVERS ON A SINGLE NETWORK SEGMENT, CONSISTING OF ALL THE FRAMES WITH A SINGLE COMBINATION OF DA AND SA.
RECEIVER	A STATION THAT RECEIVES FRAMES SENT ON A PARTICULAR CHANNEL. IF THE DESTINATION IS A UNICAST ADDRESS THERE IS AT MOST ONE RECEIVER. IF THE DESTINATION IS A GROUP ADDRESS (INCLUDING BROADCAST), THERE MAY BE MANY RECEIVERS.
RECEIVER PE	THE PREFERRED PE TO BE USED ON THIS CHANNEL, AS DETERMINED BY THE RECEIVER.
RRCF	RATE REQUEST CONTROL FRAME. SENT FROM THE RECEIVER TO THE SENDER TO EFFECT A CHANGE IN PE.
REFADDR0	THE SA IN THE ETHERNET HEADER OF THE RRCF FRAME. THIS IS THE DA OF THE RECEIVER (FOR THE CHANNEL), AND IS ALWAYS USED BY THE CHANNEL SENDER AS THE FIRST REFADDR PROCESSED.
REFADDR1.. REFADDR<n>	OTHER ADDRESSES INCLUDING BROADCAST AND MULTICAST ADDRESSES FOR WHICH THE RECEIVER IS INDICATING RATE INFORMATION TO THE SENDER. THE CHANNEL RECEIVER'S STATION ADDRESS (REFADDR0) SHOULD NOT BE PUT IN THE LIST OF ADDITIONAL REFADDR'S.  NOTE 1: AT LEAST ONE REFADDR FIELD IS NECESSARY TO SUPPORT RATE NEGOTIATION FOR BROADCAST AND MULTICAST ADDRESSES SINCE THESE CANNOT BE USED AS THE SOURCE ADDRESS IN THE ETHERNET HEADER.
SENDER	THE SENDING STATION FOR A CHANNEL, USUALLY THE STATION OWNING THE SOURCE MAC ADDRESS.
SENDER PE	THE PREFERRED PE ASSOCIATED WITH A CHANNEL, AS NOTED BY THE SENDER.

**FIG. 45**

FIELD	LENGTH	MEANING
DA	6 OCTETS	DESTINATION ADDRESS(FF.FF.FF.FF.FF.FF)
SA	6 OCTETS	SOURCE ADDRESS OF THE STATION THAT TRANSMITTED THIS FRAME
ETHERTYPE	2 OCTETS	0x886c (LINK CONTROL FRAME)
SSTYPE	1 OCTET	=3
SSLENGTH	1 OCTET	NUMBER OF ADDITIONAL OCTETS IN THE CONTROL HEADER, STARTING WITH THE SSVERSION FIELD AND ENDING WITH THE SECOND(LAST) OCTET OF THE NEXT ETHERTYPE FIELD. MINIMUM IS 32 FOR SSVERSION 0.
SSVERSION	1 OCTET	=0
CSA_ID_SPACE	1 OCTET	IDENTIFIES THE REGISTRATION SPACE OF CSA_MFR_ID 0—UNSPECIFIED 1—JEDEC 2—PCI
CSA_MFR_ID	2 OCTETS	HW MANUFACTURER ID—IDENTIFIES THE MANUFACTURER OF THE PHY CONTROLLER CHIP. THE PURPOSE OF THIS FIELD PLUS THE PART NUMBER AND REVISION IS TO IDENTIFY SPECIFIC IMPLEMENTATIONS OF THE PHY SPECIFICATION. THIS IS NOT A BOARD OR ASSEMBLY—LEVEL IDENTIFIER.
CSA_PART_NO	2 OCTETS	HW MANUFACTURER PART NUMBER—THE PART NUMBER OF THE PHY CONTROLLER CHIP.
CSA_REV	1 OCTET	HW REVISION
CSA_OPCODE	1 OCTET	0—ANNOUNCE 1—REQUEST
CSA_MTU	2 OCTETS	MAXIMUM SIZE LINK—LEVEL PDU THIS RECEIVER ACCEPTS IN OCTETS, THE DEFAULT VALUE IS 1526 OCTETS. THIS IS ALSO THE MINIMUM VALUE THAT SHALL BE ACCEPTED BY ALL ILINE10 STATIONS.
CSA_SA	6 OCTETS	SOURCE ADDRESS OF THE STATION THAT GENERATED THIS CSA FRAME
CSA_PAD	2 OCTETS	RESERVED FOR VERSION 0. SHALL BE SENT AS 0, IGNORED ON RECEPTION.
CSA_CURRENTTXSET	4 OCTETS	CONFIGURATION FLAGS, PLUS ALL CURRENT IN—USE STATUS FOR THIS STATION.
CSA_OLDESTTXSET	4 OCTETS	A COPY OF THE "OLDEST" TX FLAGS FOR THIS STATIONS, FROM THE PERIOD ENDING AT LEAST ONE PERIOD (MINUTE) EARLIER.
CSA_CURRENTRXSET	4 OCTETS	THE UNION OF RECENT FLAGS RECEIVED FROM OTHER STATION.
NEXT ETHERTYPE	2 OCTETS	=0
PAD		PAD TO REACH MINFRAME SIZE IF NECESSARY
FCS	4 OCTETS	

*FIG.52a*

FIELD	LENGTH	MEANING
DA	6 OCTETS	DESTINATION ADDRESS
SA	6 OCTETS	SOURCE ADDRESS
ETHERTYPE	2 OCTETS	0x886c (LINK CONTROL FRAME)
SSTYPE	1 OCTET	=4
SSLENGTH	1 OCTET	NUMBER OF ADDITIONAL OCTETS IN THE CONTROL HEADER, STARTING WITH THE SSVERSION FIELD AND ENDING WITH THE SECOND(LAST) OCTET OF THE NEXT ETHERTYPE FIELD. SSLENGTH IS 6 FOR SSVERSION 0.
SSVERSION	1 OCTET	=0
LARQ_HDR DATA	3 OCTETS	LARQ CONTROL HEADER DATA WITH LARQ_CTL BIT=1,LARQ_NACK=0.
NEXT ETHERTYPE	2 OCTETS	=0
PAD	38 OCTETS	
FCS	4 OCTETS	FRAME CHECK SEQUENCE

*FIG.52b*

FIELD	LENGTH	MEANING
DA	6 OCTETS	DESTINATION ADDRESS
SA	6 OCTETS	SOURCE ADDRESS
ETHERTYPE	2 OCTETS	0x886c (LINK CONTROL FRAME)
SSTYPE	1 OCTET	=4
SSLENGTH	1 OCTET	NUMBER OF ADDITIONAL OCTETS IN THE CONTROL HEADER, STARTING WITH THE SSVERSION FIELD AND ENDING WITH THE SECOND(LAST) OCTET OF THE NEXT ETHERTYPE FIELD. SSLENGTH IS 12 FOR NACK FRAMES WITH SSVERSION 0.
SSVERSION	1 OCTET	=0
LARQ_HDR DATA	3 OCTETS	LARQ CONTROL HEADER DATA WITH LARQ_CTL BIT=1,LARQ_NACK=1..7.
NACK_DA	6 OCTETS	ORIGINAL DESTINATION ADDRESS
NEXT ETHERTYPE	2 OCTETS	=0
PAD	32 OCTETS	
FCS	4 OCTETS	FRAME CHECK SEQUENCE



*FIG.52c*

FIELD	LENGTH	MEANING
DA	6 OCTETS	DESTINATION ADDRESS (FROM ORIGINAL ETHERNET PDU)
SA	6 OCTETS	SOURCE ADDRESS (FROM ORIGINAL ETHERNET PDU)
ETHERTYPE	2 OCTETS	0x886c (LINK CONTROL FRAME)
SSTYPE	1 OCTET	=4
SSLENGTH	1 OCTET	NUMBER OF ADDITIONAL OCTETS IN THE CONTROL HEADER, STARTING WITH THE SSVERSION FIELD AND ENDING WITH THE SECOND(LAST) OCTET OF THE NEXT ETHERTYPE FIELD. SSLENGTH IS 6 FOR SSVERSION 0.=6
SSVERSION	1 OCTET	=0
LARQ_HDR DATA	3 OCTETS	LARQ ENCAPSULATION HEADER DATA (WITH LARQ_CTL BIT=0)
NEXT ETHERTYPE	2 OCTETS	FROM ORIGINAL ETHERNET PDU
PAYLOAD	MIN 46 OCTETS	FROM ORIGINAL ETHERNET PDU PAYLOAD
FCS	4 OCTETS	FRAME CHECK SEQUENCE

*FIG.52d*

OCTET	FIELD	LENGTH	MEANING
FLAGSO	LARQ_MULT	1 BIT	MULTIPLE RETRANSMISSION FLAG. 0 IN THE ORIGINAL TRANSMISSION OF A DATA FRAME. FOR RETRANSMITTED FRAMES (LARQ_RTX=1), SET TO THE VALUE OF LARQ_MULT IN THE NACK FRAME THAT CAUSED THE RETRANSMISSION. THIS FLAG CAN BE USED BY RECEIVERS TO MEASURE THE ROUND-TRIP TIMES ASSOCIATED WITH THE MISS/NACK/RECEIVE-RTX PROCESS.
	LARQ_RTX	1 BIT	0 FOR FIRST TRANSMISSION OF A FRAME, 1 IF FRAME IS RETRANSMITTED. STATIONS NOT IMPLEMENTING LARQ SHALL DROP ANY DATA FRAME IF THIS BIT IS 1.
	LARQ_NORTX	1 BIT	0 IF IMPLEMENTATION SUPPORTS RETRANSMISSION, 1 IF ONLY PRIORITY IS MEANINGFUL. MAY BE USED ON A PER CHANNEL BASIS.
	LARQ_NEWSEQ	1 BIT	1 IF THE SEQUENCE NUMBER SPACE FOR THE CHANNEL HAS BEEN RESET, AND OLDER SEQUENCE NUMBERS SHOULD NOT BE NACKED, 0 OTHERWISE.
	LARQ_CTL	1 BIT	"0" WHEN IN ENCAPSULATION FORMAT
	PRIORITY	3 BITS	LINK LAYER PRIORITY OF THIS FRAME
FLAGSI_SEQ0	RESERVED	4 BITS	RESERVED, SHALL BE 0
	LARQ_SEQ_HIGH	4 BITS	HIGH 4 BITS OF SEQUENCE NUMBER
SEQ1	LARQ_SEQ_LOW	8 BITS	LOW 8 BITS OF SEQUENCE NUMBER

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*FIG. 52f. 1*

CONTROL FRAME	A FRAME GENERATED BY A LARQ PROTOCOL MODULE THAT CONTAINS ONLY A LARQ PROTOCOL HEADER AS ITS PAYLOAD.
CURRENT SEQUENCE NUMBER	THE MOST RECENTLY RECEIVED NEW SEQUENCE NUMBER FOR A CHANNEL.
DATA FRAME	ANY STANDARD ETHERNET FRAME FROM HIGHER (THAN LARQ) PROTOCOL LAYERS. A LARQ-ENABLED STATION ENCAPSULATES THE ORIGINAL PAYLOAD OF AN ETHERNET FRAME BY INSERTING A LARQ HEADER (SHORT FORM CONTROL HEADER WITH LARQ_HDR DATA) BETWEEN THE SOURCE ADDRESS AND THE REMAINDER OF THE FRAME BEFORE THE FRAME IS PASSED DOWN TO THE DRIVER FOR TRANSMISSION ON THE NETWORK.
FORGET TIMER	AN IMPLEMENTATION DEPENDENT MECHANISM TO ALLOW A RECEIVER TO RESET THE SEQUENCE NUMBER SPACE OF A CHANNEL WHEN A RECEIVED SEQUENCE NUMBER IS NOT THE NEXT EXPECTED (CURRENT SEQUENCE NUMBER+1). ONE SECOND IS A SUGGESTED DEFAULT VALUE.
HOLD TIMER, LOST TIMER	AN IMPLEMENTATION DEPENDENT TIMING MECHANISM THAT LIMITS THE TIME A RECEIVER WILL HOLD ONTO A RECEIVED FRAME WHILE WAITING FOR A MISSING FRAME TO BE RETRANSMITTED. CONCEPTUALLY, THERE IS ONE SUCH TIMER PER MISSING SEQUENCE NUMBER. THE TIMER INTERVAL IS MAXIMUM HOLD INTERVAL.
LOGICAL CHANNEL, CHANNEL	A FLOW OF FRAMES FROM A SENDER TO ONE OR MORE RECEIVERS ON A SINGLE NETWORK SEGMENT CONSISTING OF ALL THE FRAMES WITH A SINGLE COMBINATION OF DESTINATION ADDRESS, SOURCE ADDRESS, AND LINK LAYER PRIORITY.
NACK, Nack, nack	AN INDICATION FROM A RECEIVER TO A SENDER REQUESTING RETRANSMISSION OF ONE OR MORE FRAMES. ALSO, THE ACTION OF PROVIDING SUCH AN INDICATION. E.G. "TO NACK A SEQUENCE NUMBER" MEANING TO SEND A NACK INDICATION.
NACK TIMER	AN IMPLEMENTATION DEPENDENT TIMING MECHANISM USED BY A RECEIVER TO RETRANSMIT NACKS FOR MISSING SEQUENCE NUMBERS. CONCEPTUALLY, THERE IS ONE SUCH TIMER PER MISSING SEQUENCE NUMBER PER LOGICAL CHANNEL. THE TIMER IS RESET EACH TIME A NACK IS SENT FOR A SEQUENCE NUMBER. THE TIMER INTERVAL IS NACK RETRANSMISSION INTERVAL.
NEW	A NEW SEQUENCE NUMBER IS ONE WHOSE DIFFERENCE FROM THE CURRENT SEQUENCE NUMBER FOR THE CHANNEL, MODULO THE SIZE OF THE SEQUENCE NUMBER SPACE AND CONSIDERED AS A SIGNED INTEGER, IS GREATER THAN 0. IN PARTICULAR, THE NUMBERS (CURRENT+1) THROUGH (CURRENT+2047).
OLD	AN OLD SEQUENCE NUMBER IS ONE WHOSE DIFFERENCE FROM THE CURRENT SEQUENCE NUMBER FOR THE CHANNEL, MODULO THE SIZE OF THE SEQUENCE NUMBER SPACE AND CONSIDERED AS A SIGNED INTEGER, IS LESS THAN OR EQUAL TO 0. IN PARTICULAR, THE NUMBERS (CURRENT-2048) THROUGH (CURRENT) ARE OLD. NOTE, HOWEVER, THAT MOST OF THE OLD SEQUENCE NUMBERS ARE ALSO OUT-OF-SEQUENCE.

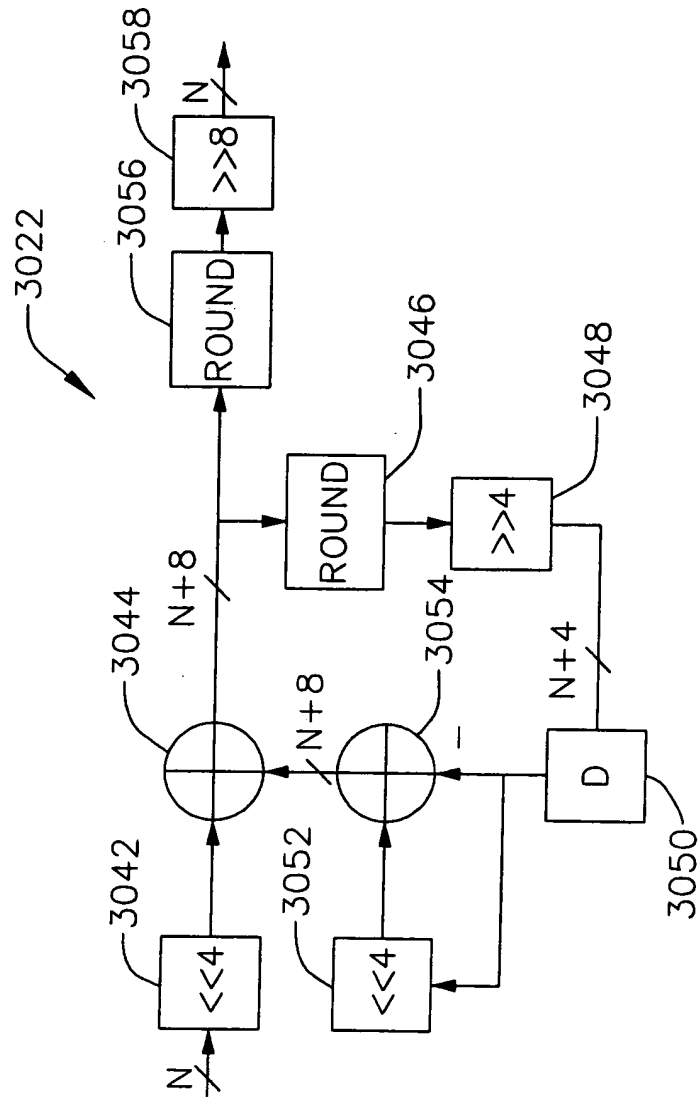
**FIG.53**

SEND SEQUENCE NUMBER	THE SEQUENCE NUMBER OF THE MOST RECENTLY TRANSMITTED DATA FRAME.
REMINDER TIMER INTERVAL	A FIXED INTERVAL. THE DEFAULT IS 50 MS. LOWER VALUES WILL INCREASE THE OVERHEAD OF REMINDERS ON NETWORK LOAD, WHILE HIGHER VALUES INCREASE THE LATENCY FOR END-OF-SEQUENCE FRAMES REQUIRING RETRANSMISSION. IMPLEMENTATIONS SHOULD NOT USE VALUES OUTSIDE OF THE RANGE 25-75 MS, BASED ON 150 MS MAXIMUM SAVE AND HOLD TIMES.
MINIMUM RETRANSMISSION INTERVAL	AN INTERVAL USED TO PREVENT TOO-FREQUENT RETRANSMISSIONS OF A SINGLE FRAME. MOST IMPORTANT FOR MULTICAST CHANNELS. THE DEFAULT IS 10 MS.
MAXIMUM SAVE LIMIT	THE MAXIMUM NUMBER OF FRAMES THAT WILL BE SAVED FOR A SINGLE LOGICAL CHANNEL. THIS IS IMPLEMENTATION DEPENDENT, AND VARIES WITH THE MAXIMUM FRAME RATE THE SENDER IS EXPECTED TO SUPPORT. VALUES OF 100 OR MORE CAN BE USEFUL FOR HIGH-SPEED APPLICATIONS SUCH AS VIDEO.
MAXIMUM SAVE INTERVAL	THE MAXIMUM TIME THAT THE SENDER WILL NORMALLY SAVE A FRAME FOR POSSIBLE RETRANSMISSION. THE DEFAULT IS 150 MS.

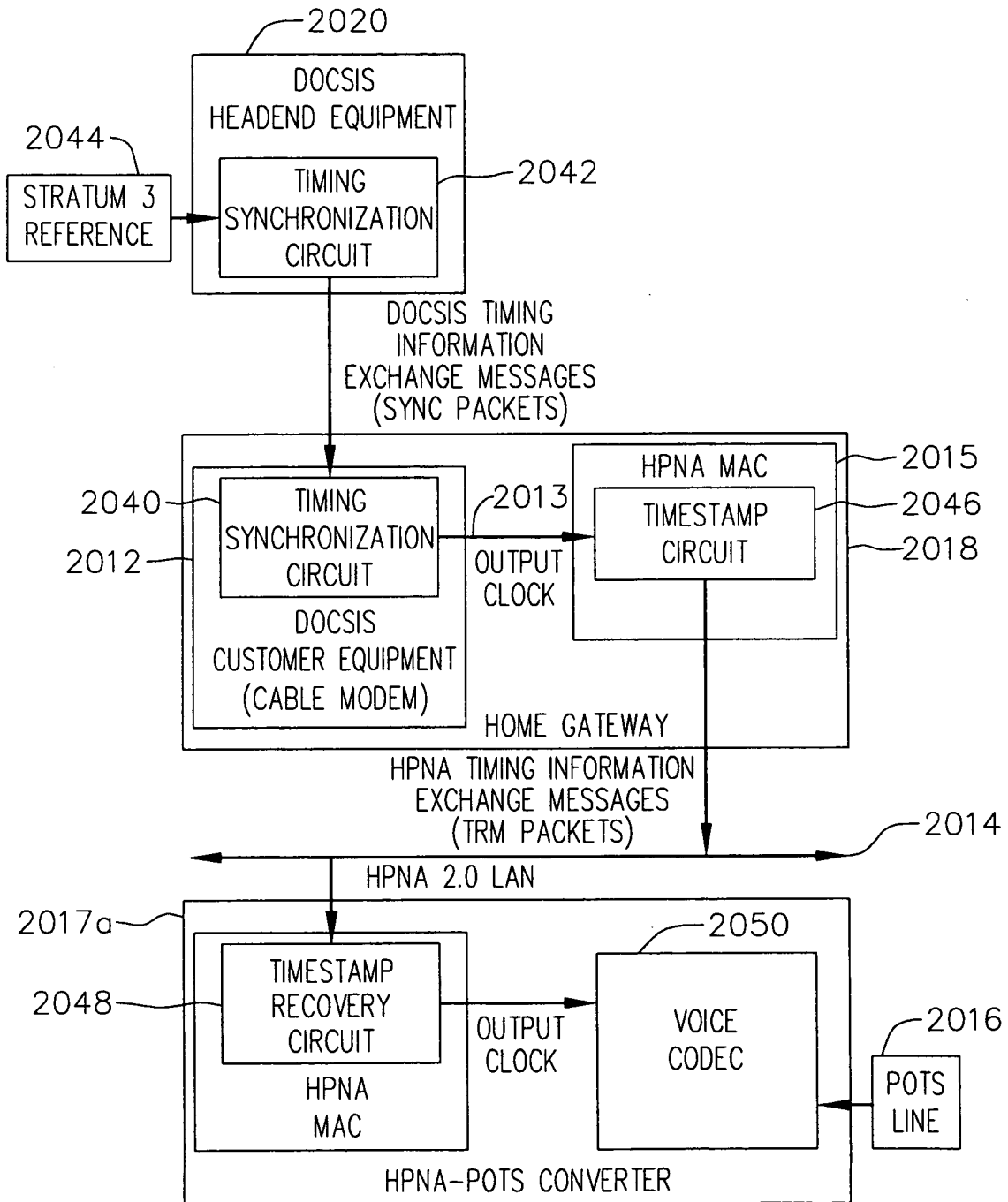
**FIG.54**

CURRENT SEQUENCE NUMBER	THE MOST RECENT SEQUENCE NUMBER RECEIVED IN A LARQ HEADER FOR THE CHANNEL, WHETHER IN A DATA FRAME OR A REMINDER CONTROL FRAME.
OLDEST MISSING SEQUENCE NUMBER	THE OLDEST SEQUENCE NUMBER FOR A FRAME NOT YET RECEIVED WHICH HAS NOT BEEN DECLARED LOST.
MAXIMUM HOLD INTERVAL	THE LONGEST INTERVAL THAT A FRAME WILL BE HELD AWAITING AN EARLIER MISSING FRAME. THE DEFAULT IS TO USE THE SAME VALUE AS MAXIMUM SAVE INTERVAL, WHICH HAS A DEFAULT OF 150 MS.
MAXIMUM RECEIVE LIMIT	THE MAXIMUM NUMBER OF FRAMES THAT A RECEIVER WILL BUFFER WHILE AWAITING AN EARLIER MISSING FRAME. THE DEFAULT SHOULD NORMALLY BE THE SAME AS THE MAXIMUM SAVE LIMIT.
NACK RETRANSMISSION INTERVAL	THE INTERVAL AFTER WHICH A RECEIVER WILL RETRANSMIT A NACK CONTROL FRAME FOR A MISSING SEQUENCE NUMBER, WITH THE EXPECTATION THAT EARLIER NACK CONTROL FRAMES OR DATA FRAME RETRANSMISSIONS WERE LOST. THE DEFAULT FOR FIXED IMPLEMENTATIONS IS 20 MS.

FIG. 58



*FIG. 73*



**FIG. 74**

PARAMETER	UPSTREAM			DOWNSTREAM		
	"10E-6 CASE	91% CASE	90% CASE	"10E-6 CASE	91% CASE	90% CASE
ACCESS DELAY	3.1	1.3	1.3	3.1	1.3	1.3
COLLISION RESOLUTION	2.7	2.7	0.8	2.7	2.7	0.8
3 UP, 1 DOWN	2.1	1.0	1.0	2.1	1.0	1.0
LAST UP	0.5	0.3	0.3	0.5	0.3	0.3
COLLISION RESOLUTION	0.8	0.8	0.8	0.8	0.8	0.8
3 UP, 1 DOWN	2.1	1.0	1.0	2.1	1.0	1.0
LAST UP	0.5	0.3	0.3	0.5	0.3	0.3
3 DOWN				1.5	0.8	0.8
3 DOWN				1.5	0.8	0.8
TOTAL LATENCY	11.8	7.4	5.5	14.9	8.9	7.1

10E-6 CASE IS 10E-6 CRA ONCE OF TWO TRIES IN HOMES WITH MAXIMUM 4MBITS/SEC RAW RATE

91% CASE IS 10E-6 CRA ONCE OF TWO TRIES IN HOMES WITH MINIMUM 10MBITS/SEC RAW RATE

90% CASE IS 10E-1 CRA TWICE IN TWO TRIES IN HOMES WITH MINIMUM 10MBITS/SEC RAW RATE

VALUES IN THE TABLE ABOVE ARE IN MILLISECONDS.

OVERHEADS:

					LINEAR	5	5	5
					PCM	NODES	NODES	NODES
IFG	PER	FRAME	LARQ	RTP_H	FRAME	CRA	CRA	CRA
	COLL	HDR	HDR	DR	SIZE	10E-6	10E-1	FIXED
0.018	0.206	0.07	8	40	160	13	4	2
MSEC	MSEC	MSEC	BYTES	BYTES	BYTES	COLLISIONS	COLLISIONS	COLLISIONS

FRAME HEADER INCLUDES PREAMBLE, FC, DA, SA, T/L, EOF

*FIG. 75*

PARAMETER	UPSTREAM			DOWNSTREAM		
	"10E-6 CASE	91% CASE	90% CASE	"10E-6 CASE	91% CASE	90% CASE
ACCESS DELAY	3.1	1.3	1.3	3.1	1.3	1.3
COLLISION RESOLUTION	0.4	0.4	0.4	0.4	0.4	0.4
3 UP, 1 DOWN	1.4	0.8	0.8	1.4	0.8	0.8
LAST UP	0.5	0.3	0.3	0.5	0.3	0.3
COLLISION RESOLUTION	0.0	0.0	0.0	0.0	0.0	0.0
3 UP, 1 DOWN	0.0	0.0	0.0	0.0	0.0	0.0
LAST UP	0.0	0.0	0.0	0.0	0.0	0.0
3 DOWN				1.1	0.6	0.6
3 DOWN				0.0	0.0	0.0
TOTAL LATENCY	5.5	2.7	2.7	6.5	3.3	3.3

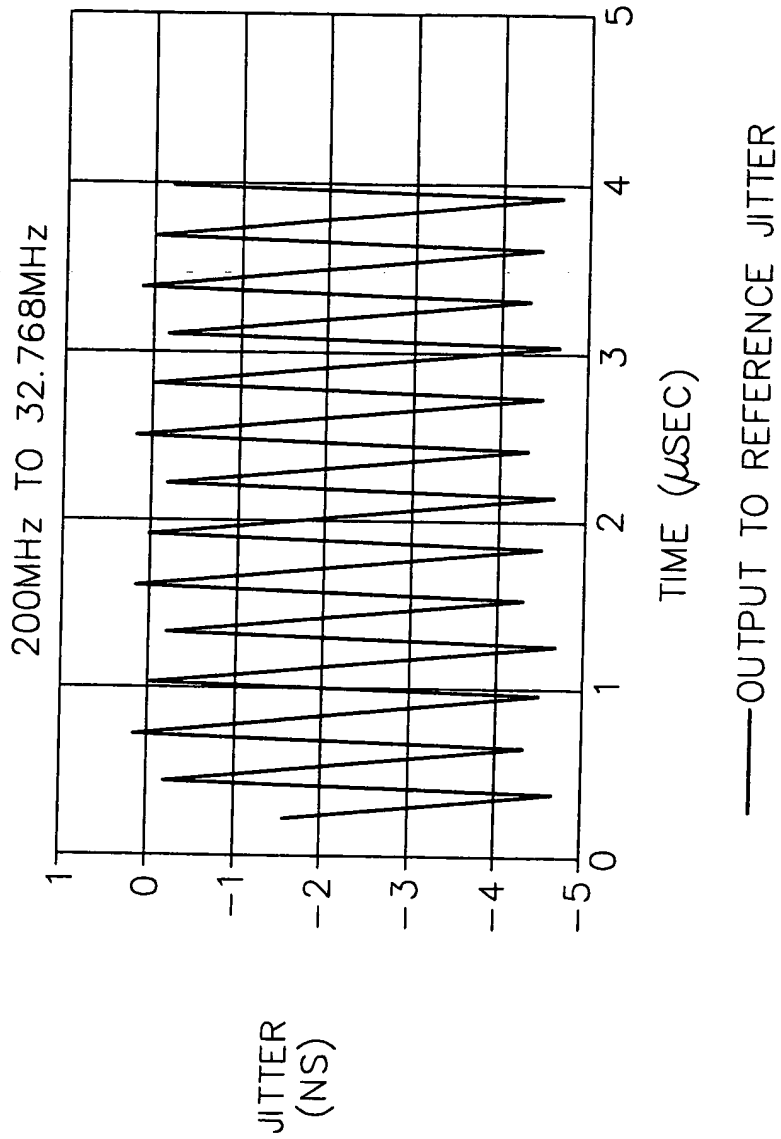
*Fig. 77(1)*

<u>Field</u>	<u>Length</u>	<u>Meaning</u>
DA	6 octets	Destination Address
SA	6 octets	Source Address
Ethertype	2 octets	(TBD) = Vohn Link Control Frame - new IEEE assignment
Type	2 octets	2 = Timestamp Report Message
Length	2 octets	Number of additional octets in the signaling frame, starting with Version field and ending with the last octet of the Data Payload field. Minimum is 2.
Version	2 octets	= 0
TSMSeqNum	2 octets	Sequence number of TSM to which the Timestamp in this message is applicable.
Timestamp	4 octets	Timestamp of a previously transmitted Timestamp Report Message, corresponding to TSMSeqNum.
Frequency	2 octets	Resolution of the timestamp and Gtimestamp fields, in ticks/1.000ms. For example, value 32768 corresponds to one clock tick at 32.768Mhz, in which the LSBit of the Timestamp corresponds to a time of 0.030517578125μsec. The Timestamp will rollover every 131 seconds = 2.2 minutes
NumGrants	2 octets	Number of Grant Timestamps specified in the payload of this control message. NumGrants may be zero. Each grant timestamp is accompanied by a Line ID and Call ID field. Including the Grant Timestamp, the total for each grant timestamp is 8 bytes.

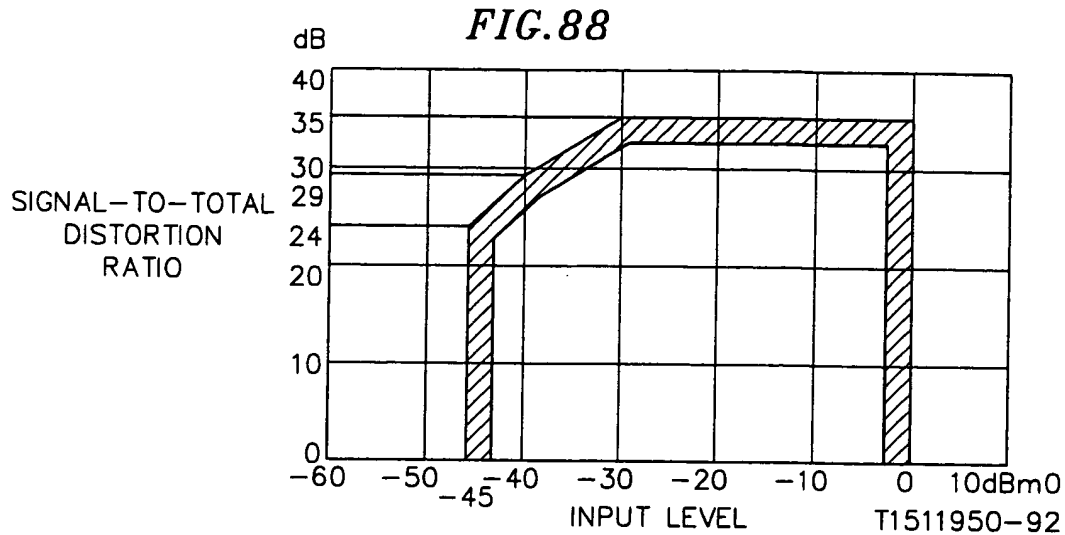
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FIG. 81



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**FIG. 89a**

INPUT LEVEL	UNIFORM QUANTIZER +COMPANDER SNR	THE REQUIRED SNR FOR THE ADC/DAC
0dBm	38.43dB	60dB
-30dBm	35.50dB	54dB
-40dBm	30.09dB	44dB

**FIG. 89b**

INPUT LEVEL	G.712 SNR SPEC	THE TOTAL SNR WITH UNIFORM QUANTIZER+COMPANDER+JITTER CLOCK
0dBm	35dB	38.32dB (60dB ADC/DAC SNR IS USED)
-30dBm	35dB	35.42dB (54dB ADC/DAC SNR IS USED)
-40dBm	29dB	30.05dB (44dB ADC/DAC SNR IS USED)

**FIG. 89c**

INPUT LEVEL	G.712 SNR SPEC	THE TOTAL SNR WITH UNIFORM QUANTIZER+COMPANDER+JITTER CLOCK
0dBm	35dB	38.38dB (60dB ADC/DAC SNR IS USED)
-30dBm	35dB	35.26dB (54dB ADC/DAC SNR IS USED)
-40dBm	29dB	30.03dB (44dB ADC/DAC SNR IS USED)